



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION IX

75 Hawthorne Street

San Francisco, CA 94105-3901

APR 30 2015

Ms. (b) (6)

Dear Ms. (b) (6):

We are in receipt of the letter you addressed to Senator John McCain who forwarded your letter on April 17, 2015, to the United States Environmental Protection Agency's (EPA) San Francisco Regional Office. Senator McCain requested that we respond directly to your concerns regarding the dispersal of aerosols from aircraft in the atmosphere and the health issues you are confronting. We are sorry that you are facing these health issues and sincerely hope you seek out the medical attention and care to address your needs.

The EPA is not aware of any deliberate actions to release chemical or biological agents into the atmosphere. What you describe in your letter are referred to as condensation trails, or "contrails," which are line-shaped clouds composed of ice particles that are visible behind jet aircraft engines under certain atmospheric conditions.

Jet aircraft engines operating at high altitudes emit tiny combustion-related particles from the burning of jet fuel, and water vapor present in the ambient atmosphere reacts with these particles to form contrails. Contrails are about 99 percent frozen water vapor and less than 1 percent combustion-related particles. These contrails spread due to atmospheric turbulence and sometimes join with other contrails and expand into large, natural looking clouds that can cover large areas of the sky. Persistent contrails can last for hours while growing to several kilometers in width and 200 to 400 meters in height.

Aircraft emission standards for gas turbine engines that power civil aircraft have been in place for about 30 years. The EPA sets the emission standards for the engines, and the Federal Aviation Administration enforces the standards. Emission standards apply to essentially all commercial aircraft and address smoke, unburned hydrocarbons, carbon monoxide, and oxides of nitrogen (NOx) for the landing and takeoff cycle. For your reference, enclosed are documents entitled "Aircraft Contrails Factsheet" and "Contrails Facts." We trust that this information will be helpful in responding to your concerns.

Sincerely,

Mike Bandrowski, Chief  
Air Toxics, Radiation and Indoor Air

Enclosures

Cc: Sen. John McCain